



Second Lieutenant Jeremy E. Lloyd

United States Air Force

Maryland School of Public Affairs

Project Course

12 May 1999

#### Abstract

The following study examines some of the major issues facing the Air Force as it transitions from an "air" to an "air and space" force. International regimes currently preserve space as a peaceful operating environment. However, given the military advantages derived from space based systems, the U.S. will continue to deploy military systems in the space environment. This dichotomy between international regimes and national policy defines the socio-political environment the Air Force will face as in transitions into space. The functional and operational difference between the Air and Space environments create some natural barriers that will make it difficult for the Air Force to link its air and space operators into one fighting force. These barriers will be in the areas of ethos, personnel, missions, and acquisitions. Present Air Force activities in these areas are not geared towards the space environment.

To meet the challenges of the space environment, the Air Force must make the following changes. Direct strategic strike provides an ethos that would de-emphasize the role of pilots and make Air Force operations more inclusive of space operators. It would also define a unique niche for the Air Force as an institution. Implementing officer liaison assignments between the air and space communities presents the most effective means of bringing the barriers between these communities. The Air Force should endeavor to assimilate all space missions, but take special care to avoid placing weapons (or what may be perceived as weapons) in space. Consolidating all space based acquisitions under

the Air Force, but through joint program offices will allow the Air Force to gain ownership of vital space assets without eliminating the other services from the decision process.

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# Higher Ground:

## Guidelines

### For the

### Air Force's Transition

### To the

### Space Environment

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### **Executive Summary**

The following study examines some of the major issues facing the Air Force as it transitions from an "air" to an "air and space" force. International regimes currently preserve space as a peaceful operating environment. However, given the military advantages derived from space based systems, the U.S. will continue to deploy military systems in the space environment. This dichotomy between international regimes and national policy defines the socio-political environment the Air Force will face as in transitions into space. The functional and operational difference between the Air and Space environments create some natural barriers that will make it difficult for the Air Force to link its air and space operators into one fighting force. These barriers will be in the areas of ethos, personnel, missions, and acquisitions. Present Air Force activities in these areas are not geared towards the space environment.

To meet the challenges of the space environment, the Air Force must make the following changes. Direct strategic strike provides an ethos that would de-emphasize the role of pilots and make Air Force operations more inclusive of space operators. It would also define a unique niche for the Air Force as an institution. Implementing officer liaison assignments between the air and space communities presents the most effective means of bringing the barriers between these communities. The Air Force should endeavor to assimilate all space missions, but take special care to avoid placing weapons (or what may be perceived as weapons) in space. Consolidating all space based acquisitions under the Air Force, but through joint program offices will allow the Air Force to gain ownership of vital space assets without eliminating the other services from the decision process.

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In 1958, when the Eisenhower administration first began the U.S. space program, the Air Force was responsible for two space-related missions, missile early warning and space defense. With each passing year, the Air Force has increased its involvement in space, assimilating more and more of the defense space missions. The founding of Air Force Space Command, in 1982, was the culmination of three decades of the Air Force's increasing role in space. Still space remained outside the "real world" of defense operations.

Desert Storm, the military campaign by U.S. and Coalition forces to liberate Kuwait from Iraqi occupation, was the first major conflict in which space systems were fully integrated at all levels of planning and operations. Pre-positioned communications, navigation, weather, missile early warning, and reconnaissance assets in Earth orbit played a central role in the allied decimation of Iraqi forces. The high frontier of space provided U.S. and Coalition forces with absolute information dominance and with it defined how wars would be fought in the future.

Air Force Lt. Gen. Donald L. Cromer, Commander of Space Systems Division during Desert Storm, observed the change in attitude towards space systems. Before the war, he observed that "space people used to be pushed off to the side. We had neither understanding nor strong support for all the things that space could do for the Air Force. Operation Desert Shield and Desert Storm will be a watershed for recognizing that space is as much a part of the Air Force and the military infrastructure as airplanes, tanks, and the ships."<sup>1</sup> Army General Carl Steiner, Commander of the XVIII Airborne Corps, put it more succinctly: "Space doesn't just help, I cannot go to war without space systems." Space is inextricably linked to military operations on land, sea, and air. Several key military functions are migrating to space: intelligence, surveillance and reconnaissance (ISR); early warning; position location; weapons; guidance; communications; and environmental monitoring.

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<sup>1</sup> Curtis Peebles, High Frontier: the United States Air Force and the Military Space Program. (Washington: Air Force History and Museums Program, 1997), p. 76

Perhaps the clearest indication of the rise in importance of space is the latest Air Force mission statement. In *Global Engagement: A Vision for the 21st Century*, the Air Force has flatly announced that it is now transitioning from an “air force” into an “air and space force.”<sup>2</sup> Becoming the U.S Space Force will require far more than bold rhetoric and cosmetic alterations. This paper will attempt to give an overview of what the transition to space will mean for the both the Air Force and the nation as a whole. In addition to addressing what are perceived to be the most crucial elements of the transition, it will also discuss possible methods for transition.

In this paper, it has been assumed that:

- **The United States will continue its movement toward the capitalization of space and its resulting increased dependency on space products for terrestrial combat operations.**

The advantages provided by space assets are of such significance that space development will continue despite the vulnerabilities that such dependency will create. This paper does not address whether or not the migration of military activities to the space environment is desirable, but assumes that the U.S. will continue present trends towards increased military usage of space.

- **The Air Force will remain committed to its pledge to transition into the space environment.** The Air Force will continue to expand its responsibilities in the space environment in an effort to become the nation’s military space agency. This paper assumes that the Air Force will remain committed to the proclamation given in *Global Engagement* and addresses some of the challenges this endeavor will bring.

Any discussion of the Air Force’s future in space must begin with an understanding of the national policies and international regimes that govern space. International and domestic laws

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<sup>2</sup> “Ensuring that air and space power continues to make its unique contribution to the nation’s Joint Team will take the Air Force through a transition of enormous importance. We are now transitioning from an *air* force into an *air and space* force on an evolutionary path to a *space and air* force” *Global Engagement: A Vision for the 21st Century Air Force* (Washington DC: Headquarters USAF, November 1996.) url: [www.xp.hq.af.mil/xpx/21/nuvis.htm](http://www.xp.hq.af.mil/xpx/21/nuvis.htm), pp. 7

and regulations, national interests, and security objectives drive the US space program. International regimes denote the boundaries within which U.S. policy makers must confine their actions. National space policy defines the overarching goals of the U.S. when it comes to the capitalization of space and then designates which agencies will be responsible for fulfilling those goals.

### **International Space Law**

Though there are few explicit references to weapons in space, current international sentiments are clearly against it. In the arena of international space law, the U.N. has acted as the lead organization in setting the laws and principles that govern the use of space. Essentially, there are five legal instruments:

- the 1966 Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies;
- the 1967 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space;
- the 1971 Convention on International Liability for Damage Caused by Space Objects;
- the 1974 Convention on the Registration of Objects Launched into Outer Space;
- the 1979 Agreement Governing the Activities of States on the Moon and other Celestial Bodies.

Of these five instruments, only one directly addresses military usage of space: the Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space. Commonly known as the Outer Space treaty, it provides the basic framework for international space law, establishing space as a free environment open for peaceful, scientific usage only. Article IV of the treaty explicitly prohibits states party to the treaty from placing nuclear weapons of any other kinds of weapons of mass destruction in space. Additionally, the moon and other celestial bodies are reserved exclusively for peaceful purpose. The establishment of military

bases, installations and fortifications, testing of any type of weapons and the conduct of military maneuvers on celestial bodies is also explicitly forbidden. The treaty does, however, allow for the use of military personnel for scientific research or for any other peaceful purposes. Article IX, which asserts that states are to avoid the harmful contamination of space and celestial bodies, could be viewed as an implicit reference to the military. States party to the treaty are directed to conduct space activities so as to avoid the harmful contamination of space and adverse changes to the environment of earth. The Outer Space Treaty entered into force in 1967 and has been ratified by 91 nations.<sup>3</sup>

The other instruments of international space law contain, at best, only implicit references to the military activities in space. The Liability Convention provides that the launching state shall be absolutely liable to pay compensation for damages caused by its space objects on the surface of the Earth or to aircraft, and liable for damage due to its faults in space.<sup>4</sup> The Registration Convention, entered into force in 1976, requests that the launching state should furnish with the U.N., as soon as practicable, the information concerning each space object. Required information includes: name of launching State; an appropriate designator of the space object or its registration number; date territory or location of launch; basic orbital parameters, including nodal period, inclination, apogee, and perigee; general function of the space object. Thus states party to the convention are discouraged from launching space objects that fail to comply with the provisions stated in the Outer Space Treaty.

In addition to the laws governing space, there are several sets of principles adopted by the General Assembly on the conduct of space activities. Unlike the aforementioned instruments, these principles do not carry the weight of international law. However, they do present another factor that U.S. policy makers must consider before embarking on new space related missions.

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<sup>3</sup> "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies," url: [www.un.or.at/OOSA/treat/ost/ost.html](http://www.un.or.at/OOSA/treat/ost/ost.html)

<sup>4</sup> "Convention on International Liability for Damage Caused by Space Objects," url: [www.un.or.at/OOSA/treat/lia/lia.html](http://www.un.or.at/OOSA/treat/lia/lia.html)

Though none of the principles contain any explicit references to military space usage, implicit references are found in the following:

- *The Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television* require that a State must notify potential receiving states and establish agreements prior to establishing such a broadcast service. This may affect future uses of space based assets in information warfare.
- *The Principle Relating to Remote Sensing of the Earth from Space* states that such activities are to be conducted for the benefit of all countries, with respect for the sovereignty of all states and people over their own natural resources.

Lastly, the Outer Space Treaty of 1967 made the United Nations Charter (1947), though not originally intended to apply to space, applicable to space. Though the charter contains no prohibitions on the military usage of space, either explicit or implicit, it does give birth to a potentially important principle. Article 51 of the charter recognizes a states right to act in individual or collective self-defense when attacked. Customary interpretations of this law recognize a broader right to self defense, one that does not require a state to wait until it is actually attacked before responding. When applied to space based assets, this law would give nations to right to protect satellite systems from attack. Additionally, it could be interpreted to give states the right to act preemptively to prevent an attack on space systems.

### **U.S. National Space Policy**

The aforementioned international regimes are important in that they serve as a guideline for U.S. national space policy. The United States adheres to the premise in international law that any act not specifically prohibited is permitted. As shown in the previous section, there are few legal restrictions on the use of space for non-aggressive military purposes. Thus, the U.S has always used space for the performance of benign military functions such as surveillance, reconnaissance, navigation, meteorology, and communications. However, the trend in national

space policy has been one of increasing militancy, as evident in the way in which space policy has evolved over the years.

For the past three decades, the U.S. has led the world in both the exploration and the capitalization of outer space. The first official space policy was Eisenhower's National Air and Space Act of 1958. This act set the organizational tone for future space operations by mandating a split between civilian and national security space programs. The newly formed National Aeronautics and Space Administration (NASA) was given control all civilian space programs; the Advanced Research Projects Agency (ARPA), an agency within the Department of Defense, was placed in charge of the activities consider peculiar to the defense of the U.S.<sup>5</sup> In addition to setting an organizational structure, the act enumerated principles that would form the core of future U.S. space policy: peaceful focus on the use of space; separation of civilian and military space activities; emphasis on international cooperation; and preservation of a space role. All presidential space directives issued since 1958 have been based on the aforementioned tenets.<sup>6</sup>

The Eisenhower administration space policy can be best described as strategic rather than tactical. Though it successfully established long term missions and legal principles, its activity was limited to pure scientific research, civil applications and limited military support applications. The aggressiveness of space policy during the Kennedy administration added a degree of substance to U.S. space policy. The generous funding that accompanied the Apollo program permitted a buildup of U.S. space technology and established an across-the-board space capability that included planetary exploration, scientific endeavors, commercial applications, and military support systems.<sup>7</sup> As the 1960s drew to a close, domestic unrest, an unpopular foreign war, and inflationary pressures led to a decline in U.S. space activity that was to continue until the Reagan administration.

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<sup>5</sup> Peebles, p. 10.

<sup>6</sup> "Space Law, Policy, and Doctrine" [www.fas.org/spp/military/docops/usaf/au-18/part02.htm](http://www.fas.org/spp/military/docops/usaf/au-18/part02.htm); p. 6

<sup>7</sup> Ibid., p. 7

The Reagan Administration sought to revitalize the space program through a series of groundbreaking presidential directives and comprehensive policy statements. The first, pronounced in 1982 and embodied in National Security Decision Directive 42 (NSDD-42), introduced the goal of expanding the involvement of the private sector in space as a third element of U.S. space operations. NSDD-85, pronounced in 1983, presented the first real departure from purely peaceful space activities by stating, as a long term objective, the elimination of the nuclear armed ballistic missile threat through the creation of a strategic defense system. Coinciding with the establishment of the Strategic Defense Initiative Organization (SDIO), the release of this NSDD brought the U.S, significantly closer to crossing the precariously thin line between space systems designed for force enhancement and developing space based war-fighting systems. The administration's second comprehensive space policy, released in 1988, was the first to address the military missions of space control and force application, increasing the potential for war fighting capabilities in space.

The Reagan administration set in motion a trend in national space policy that has continued into the present day. The Clinton administration's most recent statement of comprehensive national space policy was released in February of 1996. Though SDI has been abandoned in favor of more limited anti-ballistic missile (ABM) systems, the general goals are not much different from the goals articulated by previous administrations. Responsibility for U.S. space development is divided among the civil, national security, and commercial space sectors. In the national security sector, responsibility for defense and intelligence related space activities is delegated to the Secretary of Defense and the Director of Central Intelligence, respectively. The administration set the following guidelines for the DOD:

- Maintain the capability to execute the mission areas of space support, force enhancement, space control, and force application.
- Protect critical space-related technologies and mission aspects.
- Maintain the capability to evolve and support those space transportation systems,

infrastructure, and support activities necessary to meet national security requirements.<sup>8</sup>

- Pursue integrated satellite control and continue to enhance the robustness of DOD satellite control capability.

The policy reaffirms U.S. commitment to the use of outer space by all nations for peaceful purposes only, but with allowances for defense and intelligence-related activities in pursuit of national security and other goals. Though there are no explicit calls for the development of space-based weapons, the policy directs that, consistent with treaty obligations, the U.S. will develop, operate, and maintain space control capabilities to ensure freedom of action in space and, if directed, deny such freedom of action to adversaries. Space based assets will be used in conjunction with diplomatic, legal and military measures to preclude an adversary's hostile use of space system and services.<sup>9</sup> Though this statement is not a broad departure from the goals of the previous administrations, it further develops the notion that space, like land, sea, and air, is a potential war-fighting medium.

Despite international regimes to the contrary, the U.S. has, over the years, progressively increased its military presence in space. However, with this increased military presence, there has also been an extensive effort to ensure that the military systems put into space are interpreted as peaceful. The reluctance of the U.S. to label these systems as hostile bears some explanation. Given the military utility of the certain space systems, any distinction between a benign and hostile military space system may seem merely rhetorical. However, maintaining this distinction is important to the preservation of current international regimes against the weaponization of space. Though current international regimes against the weaponization of space result from the convergence of international sentiments, the U.S. has a significant degree of influence over the

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<sup>8</sup> .DOD is designated as the lead agency for development of the new expendable launch vehicle. National Science and Technology Council "Fact Sheet: National Space Policy," September 19, 1996 url: [www.fas.org/spp/military/docops/national/nstc-8.html](http://www.fas.org/spp/military/docops/national/nstc-8.html), p. 5

<sup>9</sup> Ibid., p. 5



nature of those sentiments. As the world's leading nation in space capitalization, any movement by the U.S. towards the deployment of hostile space systems could potentially sway international sentiments in that direction.

Presently, the value of preserving international regimes against the weaponization of space outweighs any potential benefits to be gained from developing space-based weapons. Though these weapons are technologically feasible, they are expensive to build and difficult to operate and maintain. Furthermore, the value added to military effectiveness by space based weapons systems is minimal at best. Preserving space as a peaceful environment provides multiple benefits. Space now stands as a sanctuary open to commercial and scientific capitalization. Transforming space into a battle environment would jeopardize U.S. access to these benefits. The potential military value of civilian global-mapping, communication, weather satellites, and navigation satellites would make all these systems potential targets. Additionally, opening space to weaponization would only further destabilize the current international environment. Given the minimal benefits derived from weaponizing space, it is currently against U.S. interests to initiate the transformation of space into a battlefield environment.

The ability of the U.S. to single-handedly maintain international regimes against the weaponization of space is somewhat suspect. The significant military advantages that space-based assets provide will lead other nations to pursue space operations. Concurrently, international transfers of both sensitive technologies and skilled space experts will make space accessible to a wider range of users. As technology evolves to overcome the current fiscal barriers to space based weapons there is some potential for the moral barriers to erode as well. However, this erosion is not inevitable. As Robert O'Connell observes throughout his book *Of Arms and Men*, weapons and the doctrine that guides their uses are a product of the society they serve.<sup>10</sup> Capability is not necessarily indicative of desire; ritual and culture play important roles.

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<sup>10</sup> Robert L. O'Connell, *Of Arms and Men: A History of War, Weapons, and Aggression*. (New York: Oxford University Press, 1989), p. 2

The traditions against placing weapons in space, even defensive ones, is well established, and thus it is unlikely that the merely possessing the capability to develop space based weapons will lead nations to do so. On the contrary, nations will most likely seek to weaponize space as defensive response to an adversary's counterspace systems.<sup>11</sup> Even then, it is unlikely that these defensive systems will be placed in space if they can be effectively deployed terrestrially.

Though the international regimes preserving space as a peaceful environment may not continue indefinitely, it is in U.S. interests to preserve these regimes as long as possible. At the same time, the military benefits derived from space systems makes increasing U.S. military presence in space also in the interests of the U.S. As the Air Force transitions into the space environment, it will have to take into account these equally critical, yet divergent factors.

The interplay between international space law and national space policy defines the socio-political environment facing the Air Force as it transitions into the space environment. As long as the U.S. continues to follow the international laws that govern space, operations in this environment will be unlike current operations in the air environment. For the Air Force to become a true "space force," it will have to take into account the current functional and operational differences that exist between the environments of air and space.

### **Differences Between Air and Space**

On one hand, there are obvious physical differences between the two environments. The instruments of air warfare are incapable of operating in the space environment: air breathing, jet engines verse solid fuel boosters. However, the significance of these differences in space operations is questionable. According to Dr. Benjamin S. Lambeth, "Physical differences between space and atmosphere, such as those that distinguish astrodynamics from aerodynamics,

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<sup>11</sup> Mark T. Matthews, "A Search for Warriors: the Effects of Technology on the Air Force Ethos" (A Research Report, Air War College, Air University, 1997) url: [www.au.af.mil/au/database/projects/ay1997/awc/97-118.pdf](http://www.au.af.mil/au/database/projects/ay1997/awc/97-118.pdf), p. 28

will affect the mode of space operations, but not their purpose. A functional or operational, as opposed to a systems, approach the application of space power will make the differences between orbital and atmospheric operation irrelevant.”<sup>12</sup>

Though physical differences between the two environments may be irrelevant, air and space systems have some functional and operational differences demonstrated by the use of space systems during the Gulf War. When Iraq invaded Kuwait, the first coalition assets to make their presence felt were not land, sea, or air forces, but space systems already in orbit. Though they were indispensable in determining the course and outcome of the war, these assets performed only non-combative, support missions. The Navstar Global Positioning System (GPS) provided real-time navigation and targeting; national space-reconnaissance platforms worked in conjunction with other allied capabilities to provide combat intelligence and battle-damage assessment. On the other hand, air assets played a distinctively more combative role as some 52,000 air to surface sorties delivered approximately 210,000 unguided bombs, 9,300 guided bombs, 5,400 guided air-to-surface missiles, and 2,000 anti-radar missiles.<sup>13</sup> The Iraqi air defense system, electrical grid, oil refineries, and most telephone and communication systems were all decimated in a matter of hours. The losses inflicted on Iraqi ground forces by U.S. air attacks sparked debate as to whether the use of independent air operations could achieve strategic objectives.<sup>14</sup>

Unlike the air environment, space is currently not a war-fighting element, but a war-support element. Given the role space based assets played in the Gulf War, the designation of space based assets as support elements may require further explanation. In the past, support

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<sup>12</sup> Benjamin S. Lambeth, “The Synergy of Air and Space,” *Air Power Journal*, Vol 12, no. 2, (Summer 1998): p. 4

<sup>13</sup> Eliot A. Cohen “The Mystique of U.S. Airpower,” in *American Defense Policy: Seventh Edition*, ed. Peter L. Hays, Brenda J. Vallance, Alan R. Van Tassel (Baltimore: Johns Hopkins University Press., 1997), p. 361

<sup>14</sup> Daniel Goure and Stephen A. Cambone “The Coming Age of Air and Space Power,” ed. Daniel Goure and Christopher M. Szara (Washington: Center for Strategic and International Studies, 1997), p. 8

elements operated primarily in the background, with limited real-time effects on combat operations. Now, space based assets provide decision-makers with real-time battlefield imagery, highly reliable lines of communication, and instantaneous accurate navigational information increasing the overall effectiveness of terrestrial military forces. Though these assets provide vital support to daily military activities, they are not inherently hostile in nature.<sup>15</sup> Though, in this age of precision, guided munitions, the line between hostile and non-hostile military systems may be thinning, it currently remains distinct.

The basis for these functional and operational differences lies in international sentiments and technology. The international agreements governing air and space treat the two environments as functionally different environments. A country's air space is its sovereign domain and thus, nations have the right to control it (i.e. deny over-flight privileges, attack unidentified aircraft). Space, on the other hand, follows the law of the sea. As shown in the previous section, nations are permitted to launch almost any peaceful operations they choose. Technology creates functional differences between air and space by limiting the players in the game. Presently, only a few nations possess the combination of finances and technological capacity necessary for space operations, limiting the need for war-fighting operations there.<sup>16</sup>

Though these differences play a significant role in defining U.S. space activities, they are not inherent to the space environment. As discussed earlier, international regimes are subject to prevailing sentiments and thus, their continuation is in no way guaranteed. Technological barriers are also weakening due to international transfers of both sensitive technologies and

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<sup>15</sup> The difference between a hostile and benign military system is illustrated by the difference between a radar and a radar guided missile. A radar system, by itself, is incapable of destroying a target and thus, is inherently benign. However, when mated with a radar guided missile, the radar becomes force enhancement tool, increasing the lethality of the missile.

<sup>16</sup> Based on the UN registry, the nations currently operating in space include Argentina, Australia, Canada, China, Czech Republic, France, Germany, India, Italy, Japan, Mexico, Russian Federation, Spain, Sweden, Ukraine, United Kingdom and the United States. Though the Russian Federation has researched space based weaponry (USSR carry-over), they currently lack the economic capacity to launch such weapons. "Registration of Objects Launched into Outer Space," url: [www.un.org.at/oosa/treat/reg/register.html](http://www.un.org.at/oosa/treat/reg/register.html), p. 1

skilled space experts. As the foundation for the functional and operational differences between air and space operations dissolves, so will the need for differing approaches. However, as long as these differences preserve, the Air Force will have to take them into account as it transitions into the space environment.

### **Degree of Transition**

A secondary concern centers on the interpretation of the term transition. Though *Global Engagement* states that the Air Force will transition from an “*air* force into and *air and space*” force, the degree of transformation required to accomplish this goal remains ambiguous. The language used in *Global Engagement* implies that in addition to retaining both current and projected air related responsibilities, the Air Force intends to assimilate the military responsibilities associated with the space environment.

Under this method there is room for some variation, specifically in the degree of integration. Assimilating space responsibilities will transform the Air Force into a truly multi-environment military service; operations will expand from exploitation of merely air environment to exploitation of both the air and space environments. Given the aforementioned differences between the air and space environments, there exists some potential for a deep divide to develop between the newly forming space community and the well-established air community: a divide even deeper than the one that currently exists between pilots and missile operators. Allowing this trend to continue could create serious prioritization problems as budgetary constraints force the Air Force to pick between the two communities. This conflict will only become more pronounced as the Air Force attempts to make the transition from an *air and space* force to a *space and air* force.

Given both the asymmetries of the air and space environments and the need for the Air Force to maintain linkages between the two communities, transitioning into the space environment will require major changes in four crucial areas of daily Air Force operations.

These areas are the service's ethos, personnel, the mission profile, and space acquisitions. Though each one of the following sections could consume an entire study, the following highlights some of the major issues raised in each area.

### **Service Ethos**

Ethos is defined as the disposition, character, or fundamental values peculiar to a specific person, people, culture, or movement:<sup>17</sup> what distinguishes one group from others in society. In the context of military service, ethos involves the fundamental values that set military organizations apart from their civilian counterparts. The visible differences - the uniforms, the salute, the training - are all physical manifestations of the "warrior-spirit" ethos underlying all military services.

The warrior spirit plays a crucial role in a military service's performance in combat. Though modern technology has allowed human beings to sanitize warfare by increasing the distance between combatants, death and destruction remain as the axiomatic outcomes of combat. It is a myth to believe that technological advancements will lead to low-cost, casualty-free warfare. Regardless of the means of combat, combat will always place human beings in conflict with other human beings; this is the essence of warfare. As such, warfare will always remain the preserve of warriors.

The designation of space as a non-combative environment may make it difficult for the Air Force to preserve its warrior ethos as it transitions into the space environment. Though the Air Force has officially expanded its definition of operator to include non-aviators,<sup>18</sup> this is merely a rhetorical change that has minimal effect on the nature of the work these individuals perform. While air operators will continue to manipulate the instruments of warfare, space professionals will remain operators of the instruments of war-support; the operational differences

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<sup>17</sup> The American Heritage Dictionary, 3rd ed. (1996), s.v. "Ethos."

<sup>18</sup> Global Engagement, p. 19

between the air and space environment mandate this. Space professionals, though important to the overall effectiveness of the U.S. fighting force, perform functions that support the core warrior functions performed by aviators. Though rhetoric may make space professionals operators, the preservation of space as a peaceful environment will prevent them from becoming true warriors.

The affects of transitioning to space will not be much different when space does become a combative environment. If and when weaponization occurs, the costs and risks associated with maintaining manned space platforms guarantees that these systems will be robotic or datalinked<sup>19</sup> limiting human involvement to pushing a few buttons. Though push button warfare may present advantages for the modern day war-fighter it will kill the warrior spirit needed for the effect performance of a fighting force. The increase in robotic or data-linked weaponry will lead to decrease in the need for "human" resources in the armed services. Non-deployable missions will be contracted out to private corporations. Force deployments become a thing of the past as more and more force application missions are achieved using stand-of weaponry. War fighting evolves into a sterilized exchange of ordinance between unmanned combat vehicles and remote controlled defensive systems. This is not meant to imply that "human" warfare will become a thing of the past; there will conceivably be need for real, human warriors in future conflicts. However, these operations will not be the domain of the space operators, but that of other, more combative soldiers.

An absence of true warrior spirit among space professionals will undoubtedly diminish the military performance of the air and space team that will be the future Air Force. Space operators, though crucial to modern military operations, work in a non-combative environment that will eventually sap their warrior ethos. Without this warrior-spirit, space operators loose the very thing that makes them part of the armed forces, distinguishing them from civilian space professionals. Not only will this alienate space operators from the more combative elements of

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<sup>19</sup> Matthews, p. 28

the Air Force, but it will also destroy moral within the space community.

To ensure that space professional remain part of the team, the Air Force will have to work to maintain the warrior spirit within the space community. The warrior spirit can be broken down into the following factors: courage, creativity, intelligence, a sense of purpose and a sense of honor.<sup>20</sup> It is the sense of purpose and sense of honor that drives a warrior to risk his life in order to perform his mission. Instilling space professional with the warrior spirit is discussed at length in the following section on personnel. However, some simple means methods of preventing the degradation of the warrior ethos are as follows:

- **Ensure future Air Force operators are well grounded in its heroic past.** Future warriors need to feel a connection between themselves and the deeds of past combatants.
- **Preservation of warrior skills.** Hand-to-hand combat and the use of firearms are skills that set the warrior apart from civilian counterparts. Continuing these training activities will help preserve the warriors' sense of self.
- **Contracting noncombatant services.** The Air Force should strive to make all officers and airmen warriors. If certain non-deployable forces can not be transferred to civilian organizations, then these officers should be trained to perform warrior skills.
- **Realistic combat training.** Training should always, as closely as possible, emulate real-life combat scenarios.<sup>21</sup>

As second part of service ethos deals with the way in which each branch of the armed forces relates to one another. In addition to the differentiation in roles, missions, and responsibilities, each service possesses an ethos that sets it apart from the others. This ethos not only defines the way in which the service views itself, but the way in which others view it.

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<sup>20</sup> Ibid, p. 40

<sup>21</sup> These recommendations are derived from recommendations given by Matthews in Chapter Three of his report. Though they are designed to combat the degradation of the warrior ethos in militaries using data-linked remote weapon systems, they are applicable in this situation. Matthews, p. 38



RADM J. Stark, USN summed up the ethos of each service as follows:

“...it occurred to me that the services could be characterized by different breeds of dogs...The Air Force reminded me of a French Poodle. The poodle always looks perfect...sometimes seems a bit pampered...always travels first class. But don't ever forget that the poodle was bred as a hunting dog and in a fight it's very dangerous. The Army is kind of like a St. Bernard. It's big and heavy and sometimes seems a bit clumsy. But it's very powerful and has lots of stamina. So you want it for the long haul. The Navy, God bless us, is a Golden Retriever. They're good natured and great around the house. The kids love 'em. Sometimes their hair is a bit long...they go wandering off for long periods of time, and they love water. ...Marines I see as two breeds, Rottweilers or Dobermans, because Marines come in two varieties, big and mean, or skinny and mean. ...They're aggressive on the attack and tenacious on defense.”<sup>22</sup>

Though Air Force fighter pilots may disapprove of being depicted as a French poodle, RADM Starks gives some important insight into the way that the services view one another. Each service believes that it fulfills a distinctive role in the defense of the U.S.; a role that cannot be fulfilled by the other services. Currently, the Air Force's ethos centers on the means of air combat: the manned combat aircraft. However, maintaining this pilot centered ethos will make it difficult for the Air Force to fully assimilate the responsibilities of the space environment.

In his book, *The Icarus Syndrome*, Carl builder describes the evolution of the Air Force ethos. In its relatively short history, the Air Force has alternated between two basic service ethos: 1) the strategic strike mission and 2) the glory of the combat pilot. Though the combat pilot is what most people think of when they think about the Air Force, it was the distinctiveness of the strategic strike mission that was the impetus for the Air Force's split with the Army in 1947. However, internal schisms fueled by external pressures lead the Air Force embrace the

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<sup>22</sup> Speech by RADM J. Stark , USN, Newport, RI, 10 January 1995<http://www.maye.net/whymarines.htm>

manned combat aircraft as the service ethos. With this shift, the Air Force lost its sense of identity. As the fighter aviators came to dominate the Air Force leadership, the air power theory that was the basis for the creation of the Air Force was neglected. The purpose of the Air Force increasingly became one of means, the airplane, and not ends.

It will be impossible for the Air Force to become a true air and space force as long as the service ethos of the Air Force remains centered around the combat aircraft. This ethos is wedded solely to the air environment, and ignores the synergistic effects of space operations for both the Air Force and the U.S. military as a whole. If service ethos focus around the combat aircraft, space operators fall outside of the Air Force institutional purpose and thus, would be better served in their own independent institutions.<sup>23</sup> It creates an Air Force that in place of focusing on its role in the defense of the U.S., focuses on the next round of aircraft procurement.

The Air Force must adopt a service ethos that combines the strength of the air and space environments and channels them towards fulfilling U.S. national security interests. Additionally, this new service ethos must distinguish the abilities of Air Force from its sister services. Already, the duplication of its abilities the Army, Navy and Marine Corps, is creating a drain on Air Force resources.<sup>24</sup>

Here are two plausible options for a new service ethos:

1. **Air and Space Control:** Under this scheme, the Air Force would base its *raison d'être* on the air and space control mission. Building upon the current core competency of air and space superiority - controlling what moves through air and space environment, the Air Force would focus future operations, training, and procurement around maintaining the ability to dominate the air/space environment. The mission is of fundamental importance to the Joint

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<sup>23</sup> Carl Builder, The Icarus Syndrome: the Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force, (New Brunswick, CT: Transaction Publishers, 1994), p. 215

<sup>24</sup> Matthews, p. 4

Force team. It assures freedom of action and movement for friendly forces by preventing adversaries from interfering with operations of air, space or surface forces. Without air and space superiority, everything on the battlefield is at risk. Though this ethos would theoretically allow for both air and space operators to play a fundamental role in core Air Force operations, it would weaken the preserve of space as a peaceful environment. Combat aviators would retain an important role in the day-to-day Air Force operations as the primary mean of air control. However, the role for space operators would be somewhat unclear given the absence of weapons in the space environment. Additionally, this would not provide the Air Force with an ethos that distinguishes it from the other services. Naval, Marine, and Army air components all possess similar air control capabilities.

2. **Direct Strategic Strike:** Builder suggests that the Air Force re-embrace the direct strategic strike mission as its service ethos. His rationale builds on three hypotheses: 1) the U.S. will require the ability to strike adversaries directly and promptly to meet its national security needs in the future; 2) such an ability must occur through the air and space medium; 3) airmen possess an optimized ability to operate in those mediums.<sup>25</sup> This ethos would de-emphasize the role of pilots and make Air Force operations more inclusive of space operators. Effective strategic strike requires the convergence all air force assets, from weather satellites to B-2 bombers. It would also define a unique niche for the Air Force as an institution. The other services would continue to focus on the more limited exploitation of air and space assets while the Air Force embraced its new ethos.

## **Personnel**

Future personnel concerns center around the role space professionals will play in the future Air Force. Here the functional and operational differences between the air and space environments could potentially create conflicts between the men and women who work in air and

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<sup>25</sup> Builder

space.

Prior to the Gulf War, aviators and space professionals lived and worked in almost separate worlds. Rated airmen were considered the Air Force's sole "operators"; a term used in the profession of arms to designate the men (and only recently women) whose job consists primarily of the application of force. For the most part, aviators, given their responsibilities for executing mission profiles, possessed hands-on experience in the practical uses of air power. In contrast, space professionals evolved out of the secret world of space and missile research and development. Their daily operations consisted of ensuring nuclear deterrence and otherwise supporting the nation's strategic level leadership. Thus, while the aviators led careers steeped in the warrior arts, space professionals focused on applied science, engineering, and systems management.<sup>26</sup>

Those outside the profession of arms may not understand the importance of the operator/non-operator distinction. As discussed in the previous section, military service centers on the application of force. Operators, by nature of their duties, personify the ideals that make-up the very essence of military service. They are the war-fighters: the men and women who willingly place themselves in harms way to preserve the American way of life. As such, both civilian and service member treats them with distinction, alike. In the civilian world, their lives are the subjects of popular movies such as "Saving Private Ryan" and "Top Gun." Within the military, operators dominate the command structure. There has yet to be a JCS chairman or service chief from a non-operator career field.

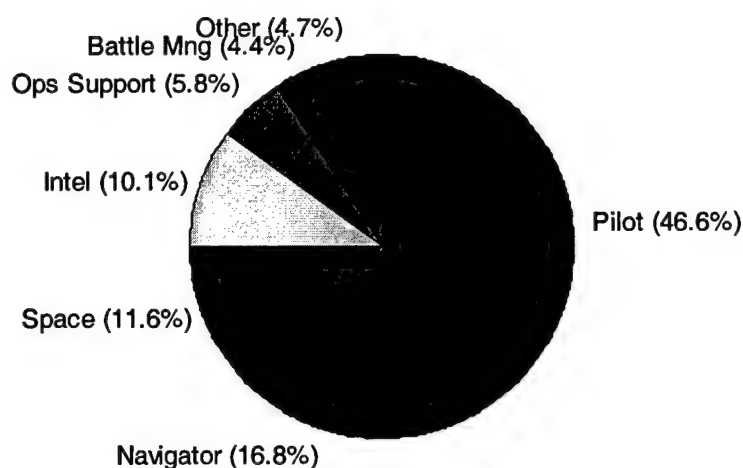
The disparity in career ethos between air operators and space professionals made for an almost preordained divide between the respective communities. In the mid to late 70s, this divide that developed into a mutual disdain as rated verse non-rated distinctions began to form between the "real men" who wore wings and the missile and space professionals were all too

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<sup>26</sup> Lambeth, p. 5

often dismissed as “techies” and “space geeks.”<sup>27</sup> Those in the space community, taking note of their rejection by the operators, pressed for isolation rather than closer integration with the flying Air Force. They developed separate organizational base and doctrine further deepening the divide. Thus, at the outset of Desert Storm, commanders and planners had only a limited insight into what space could do for them. On the other end, space professionals had little insight into the kinds of support that air, naval, and land war fighters needed.

Chart 1:  
Personnel in Operator Career Fields



As mentioned earlier, *Global Engagement* proclaims that “in the future, any military or civilian member who is experienced in the employment and doctrine of air and space power will be considered an operator.”<sup>28</sup> This all-inclusive definition of operator would expand the warrior ranks of the Air Force by lumping together combat planners and supporters with those who engage in direct combat. In addition to pilot and navigator, the air battle management, air traffic control, intelligence, operations command, operations support, weather, and space/missile

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<sup>27</sup> *Ibid.*, p. 1

<sup>28</sup> *Global Engagement*, p. 19

operations career field will all carry the operator designation.<sup>29</sup> However, rhetorical changes will not be enough to change mend the divide currently existing between the air and space communities.

Clearly, the transition to space will mean changes in the way the Air Force staffs itself. Chart 1 gives a breakdown of the operator career fields by number of personnel. The rated (flying) career fields of pilot and navigator account for over 60 percent of Air Force operator personnel. Naturally, the assimilation of more space related responsibilities could induce a rise in the percentage of space and missile operators. Though this will mean some shifting in the Air Force's personnel, this is not necessarily a harbinger of increased conflict between the air and space communities as a rise in space operators in no way indicates drop in aviators.

However, raw personnel percentages tell only part of the story. Rhetorical changes aside, the continued dominance of the space command structure by aviators reveals the Air Force's true perceptions of the nature of the work that each career field performs. Since 1991, men whose career maturation occurred primarily in the world of combat flying have commanded both AFSPC and U.S. Space Command. Though placing career pilots in charge of space shops may seem counterintuitive to those outside the Air Force, much of the ongoing integration of space with the operational community has been credited to the presence of rated aviators in senior leadership positions. However, establishing this method as a standard operating procedure will only deepen the schism between the air and space communities. Integrating the air and space communities into one coherent fighting force will require two basic things: giving new and current space operators a true claim to the operator distinction; and increasing command opportunities for tenured space professionals.

Instilling the space community with the warrior-spirit was discussed briefly in the

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<sup>29</sup> "Career Families Based on Duty Air Force Specialty Code (AFSC)," chart, url: [www.afpc.af.mil/demographics/demograf/career.html](http://www.afpc.af.mil/demographics/demograf/career.html)

previous section on service ethos. Though the actions presented there help space professionals gain an internal sense of warrior pride, they have little effect on the way in which the rest of the Air Force views them. In the wake of Desert Storm, the Air Force has endeavored to merge space with the war-fighting community. The shifting of the Air Force's intercontinental ballistic missiles (ICBM) from Air Combat Command (ACC) to Air Force Space Command gave space professionals a plausible claim to operator credentials. Missileers brought to AFSPC an operational mindset that included combat-oriented habits and rituals as being part of a concrete war plan, following normal and emergency procedures, and meeting standardized evaluation criteria.<sup>30</sup> The USAF Space Warfare Center (SWC), established in 1993, mirrors the testing and development activities of the USAF Weapons Center at Nellis AFB, Nevada and the Air Warfare Center at Eglin AFB, Florida, but gears them toward space professionals. Its avowed goal was not only to make space more relevant to the war fighter, but also to breed war fighters out of space professionals. However, these are longer-term fixes that will help to instill future space operators with the warrior mentality.

Changing the way aviators view space professionals will require some changes in the way they view the space environment. Maj. Gen. Robert S. Dickman, said it best: "We cannot expect fighter pilots...to include space in their planning and tactics and doctrine unless they know something about the systems and the environment."<sup>31</sup> To ensure that future leaders have a basic understanding of air and space operations, the Air Force has created a new Air and Space basic course. Though targeted primarily at new officers, the course will be open to selected senior NCOs and civilians. These precommissioning courses will hopefully give incoming officers a good understanding of air and space operations by focusing not on "space gadgetry terms, but on

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<sup>30</sup> Lambert, p. 8

<sup>31</sup> Robert S. Dickman, "Near Term Issues for the Air Force in Space," in The U.S. Air Force in Space: 1947 to the 21st Century, ed. R. Cargill Hall and Jacob Neufeld (Washington: USAF History and Museums Program, 1998), pp. 155

space's role in carrying out military missions.<sup>32</sup>

However, this one course will not single handedly change the way air operators view space operators. In addition to changing the mindset of Air Force personnel, there must be some changes the way the Air Force as a whole treats space operators. First off, the Air Force will have to make some changes in the currently pilot-centered command structure. During his tenure as Air Force Chief of Staff, Gen. Fogleman made some efforts to open up the currently pilot centered command structure to make room for additional operator career fields. Under his watch, a non-rated officer was placed in charge of an operational flying squadron for the first time in Air Force history. However, scenarios such as this remain the exception and not the rule. If the Air Force truly intends to walk that evolutionary path from an air and space force into a space and air force, there must be some willingness to place space operators in command of non-space activities. Doing so demonstrates that the Air Force truly designates space and missile operations as important core functions within the Air Force.

Furthermore, promotion rates, which are currently slanted in favor of pilots, must be equalized between the air and space communities. Not only will this further demonstrate the importance of space related functions, but it gives young men and women an increased incentive to enter space and missile operations.

Closing the gap between the air and space communities is an important step for the Air Force as it transitions into the space environment. Though the Air Force is currently making some strides in this area, it will take more far-reaching, organizational changes to truly integrate the divergent communities. Some viable options for achieving this goal are as follows:

- 1) Secondary career specialization for Air Force officers:** Under this scheme, officers would take on a secondary specialization in addition to their primary Air Force Specialty Code (AFSC). In addition to undergoing some basic skills training in their secondary AFSC,

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<sup>32</sup> William B. Scott, "'Milspace' Maturing Into Warfighter Roles," *Aviation Week and Space Technology* vol. 147 n 9 (September 1, 1997): p 46



officers would also serve tours in squadrons that operate in their respective secondary specialty. The purpose of this option is to broaden the expertise of individual Air Force officers. Additionally, this option would bring the different communities closer together by giving officers some real world experience in other career fields. However, implementing this option will require broad structural change in the way the Air Force operates. Personnel training, organizational structure, promotion criteria, and operations would all have to change to accommodate a new career designation system. Such grand changes will no doubt meet with difficult opposition, possibly creating more harm than good. However, given the depth of the divide between the air and space communities, such revolutionary changes may be necessary to allow the Air Force transition into an air and space force.

**2) Mandating air-to-space and space-to-air liaison assignments:** In essence, this option would work similar to current inter-service liaison systems. Aviators would serve mandatory liaison tours in an operational space squadron and vice versa. Once again, the purpose is to broaden the expertise of individual officers while bringing the air and space communities closer together. Though this option requires fewer grand changes to the Air Force career system than the previous option, there are some serious hurdles to its implementation. Ensuring that liaison officers possess the skills needed to perform in an unfamiliar operational environment may require additional training. Additionally, getting officers to participate in such a program will require promotion based incentives and thus, requires a wholesale revision to the promotion system. Given the amount of resistance mounted against mandatory joint staff assignments, implementing this option will no doubt meet with serious internal resistance.

**3) Mandatory Air and Space courses:** Another way of integrating the air and space community is through increased education. In addition to an introductory space course, officers could take more advanced courses in air and space application throughout their career. Though more academic than the other options, this approach requires the fewest wholesale changes to the Air Force career system. Courses could be taught through a variety

of different means with low to minimal upheavals for individual officers. Additionally, this option will be the easiest to pass, bureaucratically speaking. However, the ability of course work to give officers insight into the operational tempo of the air and space career field is questionable. Ease of implementation will come at the sacrifice of more hands on experience.

## **Missions**

The functional and operational differences between the air and space environments will affect the way in which the Air Force approaches the missions designated to the space environment. Prior to the push for integration, the missions of the Air Force centered on the exploitation of air-based weaponry to gain air control. However, space is a distinct environment and carries a its own set of rules and limitations. As such, incorporating "space missions" will require more than just extending traditional air power activities into space.

In response to the most recent National Space Policy, U.S. Space Command (USSC), the nation's joint space command headquarters, has designated four primary mission areas for the space environment: space force support, space force enhancement, space control, and space force application.<sup>33</sup> Space force support missions are those centered on launching and operating satellites. Space force enhancement missions provide navigation, weather, missile warning, satellite communications, and intelligence support to the warfighter. USSC defines space force application as the engagement of adversaries from space. Space control involves assuring U.S. access to, and operation in, space—and denying enemies that same freedom.<sup>34</sup>

To transition from air to space, the Air Force will, conceivably, have to perform the above list of missions. Given the predominance of the Air Force in USSC, this does not seem like a

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<sup>33</sup> "U.S. Space Command Missions" U.S. Space Command web site, url: [www.spacecom.af.mil/usspace/missions.htm](http://www.spacecom.af.mil/usspace/missions.htm)

<sup>34</sup> Ibid.

difficult task. Already, Air Force Space Command (AFSPC) is the major command providing space forces for the USSC. From an operational perspective, AFSPC has over 97 percent of the DOD space personnel and commands approximately 96 percent of the USSC budget.<sup>35</sup> However, a more difficult situation involves how the Air Force will handle the missions given the aforementioned need to preserve space as a peaceful operating environment. Action taken by the Air Force to assimilate the space control and force application mission areas could potentially undermine international regimes against the weaponization of space.

Most of the military space program's activities take place in the space force support and force enhancement mission areas.<sup>36</sup> Space force support activities are inherently benign. Launching and controlling satellites are not acts of war, but activities carried out daily by both military and civilian organizations. The systems and activities involved in the space force support mission are also, in themselves, non-hostile. As discussed in earlier sections, weather, navigation, and intelligence satellites are not the instruments of warfare. Assimilating and performing these space activities will not affect the international space regimes.

Space force application and space force control systems are potentially more combative in nature and thus, will create difficulties for the Air Force. Presently, the only systems used in force application are intercontinental ballistic missiles.<sup>37</sup> Given that these systems are deployed terrestrially, they comply with international regimes. However, USSC is actively identifying potential roles for missions and payloads for future scenarios. When the U.S. stands up a ballistic missile defense system, the Air Force will acquire and operate space-based ballistic missile defense assets, provide battle management/ command, control, and communications for

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<sup>35</sup> Of the approximately 43,000 personnel assigned to USSC, 42,000 are Air Force. Theresa M. Foley, "A New Theater for Space Military Space Players," *Aerospace America* vol. 34 no. 9 (September 1996), p. 40.

<sup>36</sup> Gil I. Klingler and Theodore R. Simpson. "Military Space Activities: The Next Decade." *Aerospace America* vol. 36 no.9 (January 1998): 44-51

<sup>37</sup> Ballistic missile travel through space to reach their target and are thus considered "space weapons"

the system, and integrate ballistic missile force into the force structure. Whether or not these systems comply with international regimes will depend on where they are deployed. At present, the Anti-ballistic Missile Treaty prohibits the deployment of a space based ABM system.<sup>38</sup> Additionally, any attempts to deploy weapons in space will disrupt the current stability of the space environment.

Space control involves a mix of hostile and non-hostile activities. Presently, AFSPC uses various sensors to track and catalogue man-made objects floating in space-a non-hostile activity. However, space control is also related to space superiority, which may include denying an enemy the use of space. For space control, the Air Force intends on acquiring and operating anti-satellite capabilities. Pursuing space control in this manner may conflict with the preservation of space as a free peaceful environment.

The space control mission is merely the extension of a current air power theory into the space environment. The space environment however coincides more with the sea environment than air. Though the sea is open to peaceful usage by all nations in times of peace, in times of war, free passage of the sea is not guaranteed. Civilian ships are not normally attacked. However, nations have traditionally reserved the right to seize/sink even non-military ships if they are suspected of carrying military cargo. When applied to space, this could potentially hinder U.S. attempts to control the space environment during wartime. Communications, navigation, and weather satellites currently belonging to civilian, commercial organizations can all be easily converted to military use.

To effectively "control" space, the U.S. would have to not only destroy the both military and civilian space assets of an adversary, but target any space systems that the enemy could potentially gain access to. This includes the satellite systems of an enemy's allies, even if these allies are not directly involved in the dispute, creating some potentially devastating escalation

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<sup>38</sup> "Space Law," p. 4

scenarios given China and Russia's allies in the Middle East and Asia. Since it may be decades before space control becomes a serious issue for war planners, any discussion on the potential pitfalls of space control missions are mostly conjectural. However, it is clear that the space control mission does not mess well with the current space environment.

Determining future missions will require the Air Force to balance of two divergent factors: the need to follow international regimes prohibiting the weaponization of space; and the need to assimilate and perform space based activities in order to become the military agency in charge of space. The following options are based on these factors.

- 1) **Assimilate only space force support and enhancement missions:** This approach would ensure that the new Air and Space Force missions do not violate international agreements, while allowing the U.S. to exploit the advantages of the space environment. However, it would leave two vital mission areas designated to space unfulfilled. If the Air Force doesn't assimilate these missions than some other service will. This would be particularly damaging in the long-term. When space does become a war environment, losing these critical combat functions would weaken the Air Force's claim to the space environment.
- 2) **Assimilate all missions except space control:** This approach also ensures that the activities of the Air and Space Force comply with international regimes. However, it would leave a crucial mission area up for grabs and thus, this options possesses the same long-term consequences as the first option. Additionally, there are some near term consequences if the Air Force should attempt to use space-based weapons to pursue force application.
- 3) **Assimilate all missions:** Taking control of all space-based missions would clearly establish the Air Force as the military service in charge of space. Bureaucratically speaking, such a move would set the stage for the Air Force's transition to space. However, this move has some significant downsides. Space control and enhancement missions are combative and thus conflict with the free, peaceful nature of the space environment.

## **Acquisitions**

Though the differences between the air and space environments have little effect on acquisition strategies, moving into the space environment will mandate some changes in the way the Air Force approaches acquisitions. Gaining full control of the next generation of space acquisitions is a crucial step in the Air Force's transitions into the space environment. Ethos, missions and personnel aside, quite often what makes a service predominant in a particular environment is ownership of the crucial system that operates there. Intuitively, it would seem that becoming the nation's primary military space agency will involve assimilating most of the responsibility for the research and development of space systems. However, given the degree of opposition to this sort of consolidation throughout the Department of Defense, this approach may not be possible.

There is an acknowledged need for some changes in the current space acquisition program. In 1993, the Blue Ribbon Panel on the Future of the Air Force in Space - a senior-level working group composed of both space and aviation professionals - concluded that the competition among multiple space agencies - Air Force, Army, Navy, Ballistic Missile Defense Organization, Advanced Research Projects Agency, and National Reconnaissance Office- had resulted in inefficiencies in space acquisitions. In specific, a fragmented space acquisition policy has resulted in: (1) fragmented responsibilities; (2) duplicate facilities, staffs, and infrastructures; (3) deficiencies in achieving economies of scale, optimizing existing capabilities, and focusing on validated operational requirements; and (4) less effective forces because several organizations are developing space hardware that are not interoperable, thus complicating joint military operations.<sup>39</sup> In 1994, a study on national space issues by the General Accounting Office (GAO) reiterated the need for some consolidation within the military space program pointing to wasted resources and decreased military effectiveness.

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<sup>39</sup> United States General Accounting Office, National Space Issues: Observations on Defense Space Programs and Activities, Letter Report, 16 August 94, GAO/NSIAD-94-253, url: [www.fas.org/spp/military/gao/gao94253.htm](http://www.fas.org/spp/military/gao/gao94253.htm), p. 8

Despite the above recognition of a need for consolidation in military space, there is little agreement on how this consolidation should take place. In 1997, the Air Force proposed to Office of the Secretary of Defense (OSD) that the Air Force become the single manager of DOD space acquisition. Under this proposal, the Air Force would act as executive agent for all space acquisitions, with the Naval and Army Space Command maintaining their current space operations responsibilities.<sup>40</sup> However, this attempt to consolidate space acquisition met with serious opposition from both inside and outside of the DOD. The Navy and the Army adamantly rejected this proposal fearing that their individual space support need would be sacrificed to Air Force operational acquisitions, particularly fighter and bomber aircraft.<sup>41</sup> Each then forwarded their own proposal, which were summarily rejected by the Air Force and the OSD.

At present, there is some degree of consolidation under the Space Architect. The Space Architect falls under the Deputy Under Secretary of Space (DUSD Space) in the OSD. The Architect is responsible for developing space architecture across the range of DOD space mission areas. The Architect is further responsible for integrating validated requirements into existing and planned space architectures. The Space Architect also assist the DUSD (Space) with development of the space master plan which depicts how assured missions support is provided by space systems to the National Command Authority, Combatant Commanders and operational forces. All acquisition proposal involving space are referred to the Architect for evaluation and integration into existing or planned space architectures. However, the Space Architect has no direct acquisition authority per se.

Space acquisition remains predominantly an Air Force function. Currently, the Air Force controls approximately 96 percent of the defense space budget, which competes on an annual basis with other Air Force requisitions;<sup>42</sup> a good portion of which goes to funding operational

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<sup>40</sup> Dickman, p. 152-3

<sup>41</sup> John Pike "Waiting for Starfleet" url: [www.fas.org/spp/eprint/starfleet.htm](http://www.fas.org/spp/eprint/starfleet.htm)

<sup>42</sup> Foley. p. 40

space responsibilities such as satellite control and the expendable launch vehicle program. As more military functions migrate into the space environment, supplying space assets to the DOD as a whole could potentially require more than the traditional one-third of the defense budget the Air Force already receives. When coupled with the towering cost of current air operations around the world, concentrating the cost of future space procurement within the Air Force could lead to some serious degradation of U.S. air capabilities.

While serving as CINCSpace, General Charles Horner, summed up future Air Force concerns in saying, "As long as each service is funded at an artificial rate almost equal to one third of the defense budget, the Air Force will be hard pressed to fill its core air responsibilities, while expanding its role in space...at some point, the nation must ask itself whether our air and space capabilities should remain artificially limited within the present budgeting methodology, when both functions are becoming of greater importance to our defense strategy."<sup>43</sup> However, attempting to restructure the DOD budget in favor of the Air Force would be an exercise in futility: the other service would never allow it.

Traditions and inter-service rivalries aside, consolidation of all military space acquisition under any one service could potentially decrease the ability of the other services to acquire crucial systems, especially those that lack a certain "multi-service" appeal. The Air Force proposal to cancel the Milstar communications satellite, though laudable on its merits, highlights the dangers that space need of the other services - in this case could be sacrificed to Air Force budgetary priorities.<sup>44</sup>

Of the areas affected by the transition, acquisitions will require the most interservice coordination. Gaining control of space acquisitions would give the Air Force credible claim to

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<sup>43</sup> Gen. Charles A. Horner, "Air Power: Growing beyond Desert Storm," Aviation Week and Space Technology, 16 April 1997, 73.

<sup>44</sup> Pike, p. 1



the title of Space Force. However, it is not entirely clear that the other services will accept this proposition. The above analysis leaves the Air Force with a limited set of options for dealing with responsibility for space acquisitions. The following lists present five plausible options:

- 1) **Place acquisitions responsibility with the Air Force:** This option has been both suggested and rejected in the past. As mentioned earlier, despite the fact that the Air Force already controls over 90 percent of the space budget, the other services are reluctant to relinquish this responsibility. Additionally, as discussed earlier, placing space entirely under the Air Force would require some restructuring of defense budget that may not be acceptable to the other services.
- 2) **Place acquisitions responsibility with the Air Force, but through joint program offices:** This option originated from U.S. Space Command. Same as above, but new space acquisition would originate from joint program offices, theoretically giving the other services greater input on the process. Still, programs would be financed by Air Force money, thus ensuring Air Force “ownership” of vital space systems.
- 3) **Create a space corps within the Air Force to separately acquire and operate space systems:** This could also be entitled the “old air corps” approach. As discussed earlier, creating a separate air corps could bypass interservice budget battles. However, it could create more problems by isolating the space community from air community.
- 4) **Create a joint, space system procurement office within the Office of the Secretary of Defense:** This option most closely resembles the present situation. Though it addresses the individual services’ concerns over access, it currently fails to address budget distribution problems.
- 5) **Create an independent defense space agency to acquire and manage space systems:** This option takes the independent Air Force space corps idea and takes it to the next level. It possess the same costs and benefits as the space corps approach, with the additional cost of erasing the Air Force’s claim to the space environment.

As evident from the above analysis, transitioning into the space environment could potentially create a host of problems for the Air Force. Not only will it require new mission profiles, personnel structure, and acquisition priorities, but it will potentially alter the very ethos underlying the Air Force.

One of the key issues facing the Air Force deals with the preservation of international regimes against the weaponization of space. As mentioned in previous sections, space is currently designated as a peaceful environment. However, whether space remains peaceful will depend in part of the choices the Air Force makes as it assimilate space responsibilities. The difficulties associated with the current functional and operational difference between the air and space environment may lead some to question the utility of preserving these distinctions. Though designating space as a war-fighting environment may smooth the Air Force's transition, this is not in the best interest of the United States as a whole. U.S. national security decision should be driven by the interests of the nation as a whole and not by parochial priorities. Preserving space as a peaceful environment provides multiple benefits. It allows for the unhindered exploitation of the commercial and scientific capitalization benefits of the space environment and preserves the current stability of the space environment.

As the foundation for the functional and operational differences between air and space operations dissolves, so will the need for differing approaches. However, as long as these differences persevere, the Air Force will have to take them into account as it transitions into the space environment.

A second key issue deals with the military utility of the space environment. Given the hardships the Air Force will have to endure to transition into an air and space force, some may question the necessity for this change. If space is to remain a peaceful environment, then transitioning into space environment is not necessary and the Air Force would be better served by focusing of its responsibilities in the air environment. Though this line of argument may hold

some merit in an ideal world, real world constraints make it a dangerous road follow. Space provides significant military advantages ranging from communications to real-time targeting data. In the future, new actors will attempt to create their own space-based networks. At the very least, other parties will attempt to deny the U.S. and other space powers the advantages derived from space. The increase in multi-national space activity will no doubt trigger conflict as states battle for control in this new environment. Though preserving the international regimes against the weaponization of space is currently in the interest U.S., these regimes will not continue indefinitely. When they do fall, the U.S. will be best served by having the organizational structure in place to meet these challenges.

There are significant military advantages to be gained from properly exploiting peaceful space. Combat operations in the land, sea, and air environments are all enhanced through the exploitation of space assets. The Air Force's current focus on operating in the space environment makes the Air Force the ideal choice for recipient of the responsibilities of the space environment. Transitioning into an air and space force will not only be good for the Air Force, but good for the nation as a whole.

### **Recommendations**

The functional and operational difference between the Air and Space environments create some natural barriers that will create difficulties for the Air Force as it tries to link its air and space operators into one fighting force. These barriers will be in the areas of ethos, personnel missions, and acquisitions. In removing these barriers, the Air Force must also be careful not to take any actions that would irreparably damage the international regimes preserving free space.

### **Service Ethos:**

Given that space will remain peaceful, the Air Force will have to ensure that its warrior ethos survives the transition to the space environment. Presently, terrestrial Air Force activities

keep the Air Force “grounded” in its warrior roots. However, as space based assets allow for data-linked and robotic systems to take the place of manned combat missions, remaining a war-fighting service will be more difficult. Simple ways of remaining a military service are:

- Indoctrination programs on Air Force history for entry level service members;
- Continue hand-to-hand combat and firearms training for all service members;
- Utilize technology to make combat training more realistic.

All of the above actions involve internal Air Force programs that should meet with little political resistance.

Additionally, the Air Force must adopt a service ethos that combines the strength of the air and space environments and channels them towards fulfilling U.S. national security interests. This new service must also focus around abilities that will distinguish the Air Force from other services. This service ethos will affect everything the Air Force does as it becomes the service’s *raison d’être*

Of the two options mentioned, **direct strategic strike** best fulfills the aforementioned concerns. This ethos would de-emphasize the role of pilots and make Air Force operations more inclusive of space operators. It would also define a unique niche for the Air Force as an institution.

Implementing this option will require visionary leadership willing to make the broad changes necessary. Though this ethos could raise objections from the well entrenched pilot syndicate within the Air Force, top-down enforcement from the highest levels can easily silence any resistance-such is the beauty of the military.

### **Personnel:**

Closing the gap between the air and space communities is an important step for the Air Force as it transitions into the space environment. Though the Air Force is currently making

some strides in this area, it will take more far-reaching, organizational changes to truly integrate these two divergent communities. Some viable options for achieving this goal are as follows:

Successfully integrating the air and space communities rests in finding some means of bridging the gap between combat air operations and supporting space operations. **Implementing officer liaison assignments** between the air and space communities presents the most effective means of achieving the aforementioned goals. Here, most of the additional training and restructuring nightmares associated with giving officers a secondary AFSC are avoided. What remains is a relatively simple program in which the air and space communities trade officers. The purpose of making it mandatory is to ensure that every officer get to share in the experience.

This approach is also a step up from mere academic indoctrination. Giving officers hands on experience will help them to appreciate the work performed in the "other" community.

Given the amount of resistance mounted to similar programs implemented in the past, this option is sure to be unpopular. However, dedicated, top-down commitment to implementation of the program will assure it success.

### **Missions:**

Determining future missions will require the Air Force to balance of two divergent factors: the need to follow international regimes prohibiting the weaponization of space; and the need to assimilate and perform space based activities in order to become the military agency in charge of space. Keeping space peaceful would seemingly require the Air Force to forego the more combative aspects of the space control and force application. However, given that combative elements such as ICBMs and ASAT missiles all operate from terrestrial ground station and aircraft, this is not necessary. Here the Air Force can set a precedent by foregoing the development of space based weapon systems, both offensive and defensive. Thus, the Air Force should endeavor to **assimilate all space missions**, but take special care to avoid placing weapons

(or what may be perceived as weapons) in space.

This approach encounter some resistance as it seemingly leaves our space based assets vulnerable to attack. However, this is a misperception based on the belief that space assets can only be protected by space based defense systems. Though current technology limits our means for protecting vital space assets, this is likely the result of disinterest as opposed to technological unfeasibility. Setting restrictions against the use of these systems will set the stage for future developments.

Additional resistance may arise from those who feel we pass up the military benefits of space by avoiding weaponization. However, this is also a misperception. Non-hostile space based assets can provide support elements that significantly increase the destructive capabilities of both air and ground based weapons systems. Strike II, a test out of Nellis AFB, demonstrated the potential offered by GPS for real-time mission targeting. In that exercise, satellite-derived target-location coordinates were used to successfully vector an F-15E aircraft to attack a simulated mobile Scud launcher at night.<sup>45</sup>

### **Acquisitions:**

The acquisitions situation remains sticky no matter what the nature of the space environment. Clearly, the U.S. will avoid the procurement of weaponized space assets. However, eliminating the current waste and inefficiency due to agency overlap remains a difficult decision. Of the areas affected by the transition, acquisitions will require the most interservice coordination. Gaining control of space acquisitions would give the Air Force credible claim to the title of Space Force. However, it is not entirely clear that the other services will accept this proposition.

Here, the Air Force's best bet is to attempt to **consolidate all space based acquisitions**

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<sup>45</sup> Lambeth, p. 9

**under the Air Force, but through joint program offices.** This would allow the Air Force to gain ownership of vital space assets without eliminating the other services from the decision process. The Army, Navy, and Marines would retain an avenue for space procurement particular to their individual needs.

Resistance from the other service is likely to be stiff, especially if this move involves changing the distribution of the defense budget to give the Air Force a greater share. However, given the current predominance of the Air Force in space based acquisitions, this scenario will occur de-facto, regardless of the resistance of the other services. A transitional process that allows the Navy and Army to keep their current space system, but gives the next generation of space systems to the Air Force may help to ease their concerns.

Additionally, if the Air Force improves its performance as a provider of space based assets it is highly likely that the other services will turn to the Air Force of their own accord. Thus, by proving itself capable in a more limited role, the Air Force could eventually win control of all space acquisitions.

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